

# Session 2: Alternative Fuels



# Alan Jones & Jonathan Overly

**-TDOT-**

**-East Tennessee Clean Fuels Coalition-**





# **Biofuel Myths:**

## **• Sorting Fact from Fiction**

**Tennessee Alternative Fuels and Bioenergy  
Conference**

**Montgomery Bell State Park**

**August 16, 2010**

**Alan Jones**

**Tennessee Department of Transportation**

**Jonathan Overly**

**East Tennessee Clean Fuels Coalition**

# Beware of Myths



“For the great enemy of the truth is very often not the lie – deliberate, contrived and dishonest, but the myth, persistent, persuasive, unrealistic. We enjoy the comfort of opinion without the discomfort of thought.”

John F. Kennedy

# Biofuel Myths Often Products of FUD Marketing

- Fear, uncertainty and doubt (FUD)
- Tactic of rhetoric and fallacy used in sales, marketing, public relations, politics and propaganda
- Strategic attempt to influence public perception by disseminating negative and dubious/false information designed to undermine the credibility of beliefs
- FUD is a manifestation of the appeal to fear



# Common Myths Illuminated by Facts

- More light, less heat
- Seven of the most common and enduring biofuel myths, half-truths and urban legends
- Point-by-point rebuttals of biofuel misconceptions
- Facts, but also interpretations of facts
- We welcome your feedback

# Myth Number One:

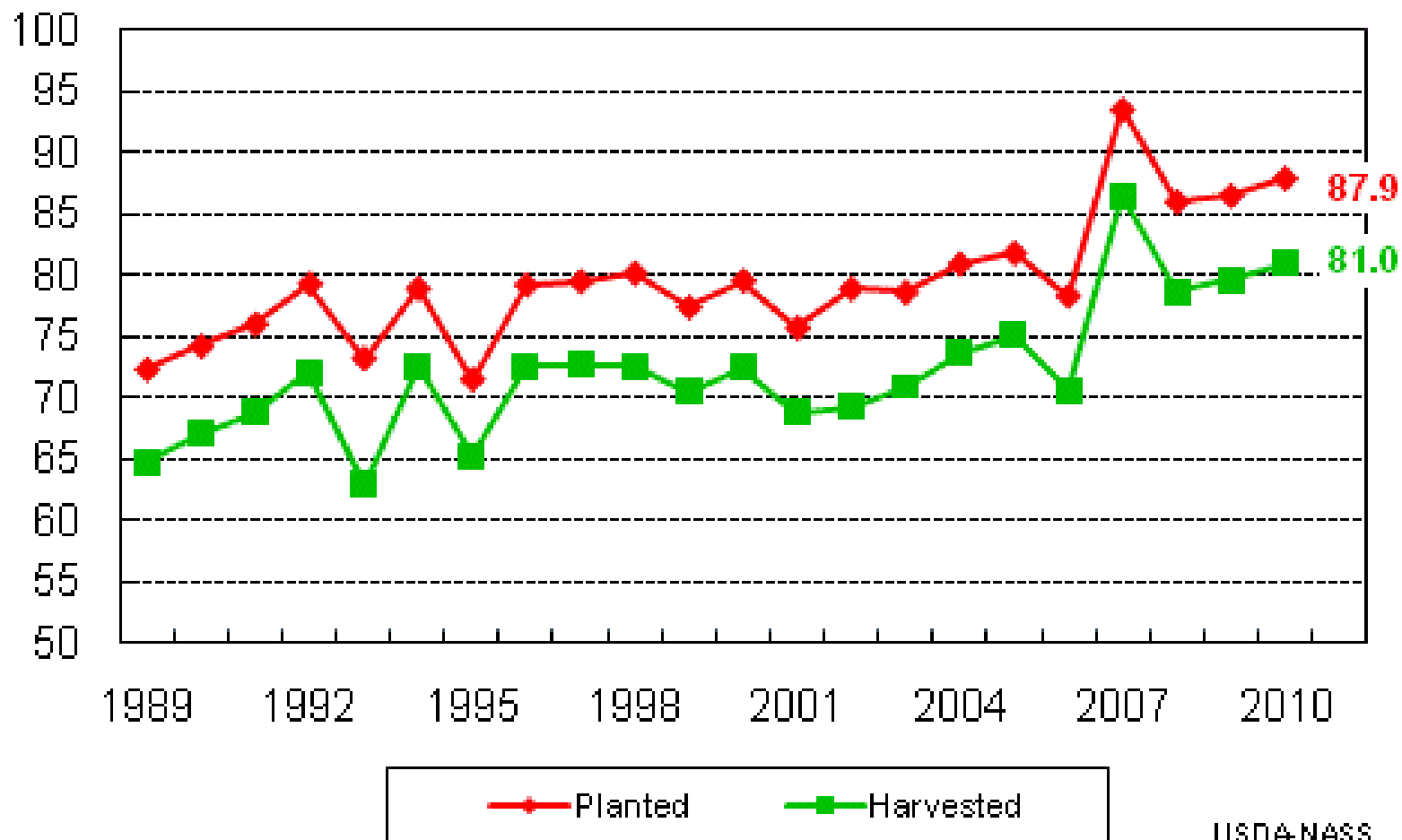
## Food vs. Fuel

- Myth – Using food crops for fuels takes food from people and increases food prices
- U.S. farmers have ability to produce harvests large enough to meet needs for food, feed, fiber & fuels
- Most crops grown to feed livestock
- Livestock feed and food for people still available after producing biofuels from food crops
- Biofuels a small contributor to food price increases
- Real reasons for global hunger



# U.S. Corn Acres

Million Acres



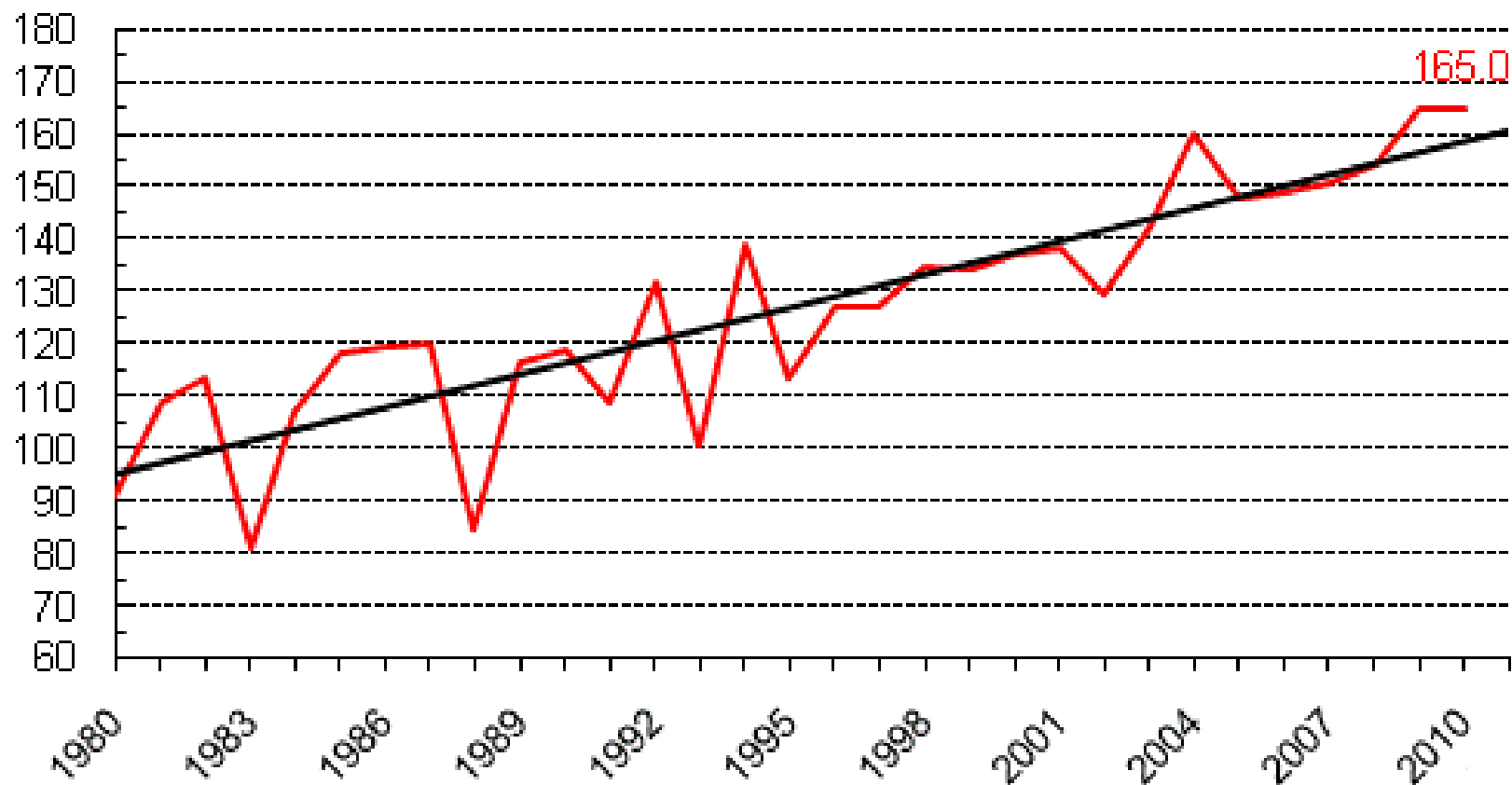




# U.S. Corn Yield



Bushels/Acre

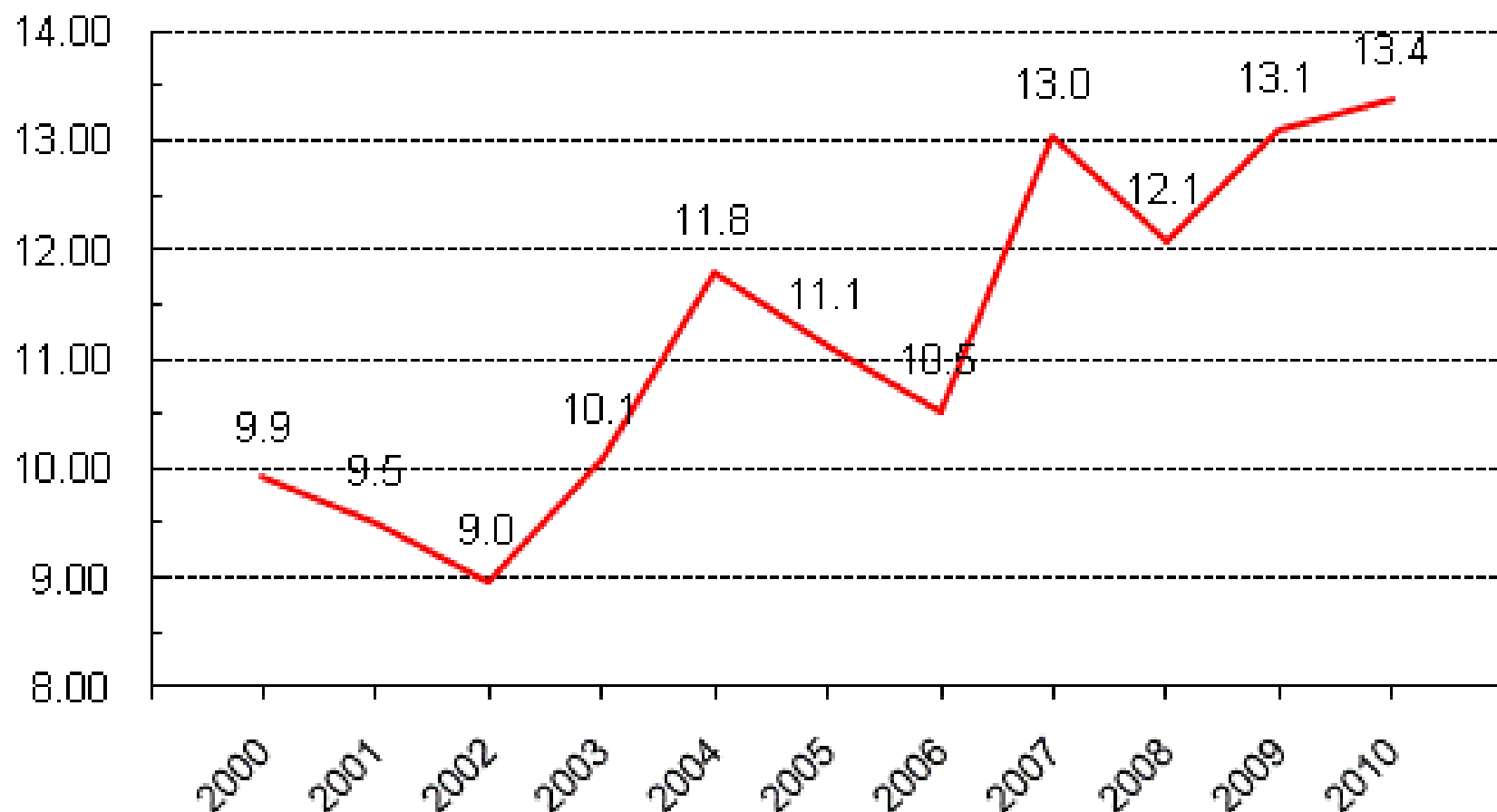




# U.S. Corn Production



Billion Bushels



USDA-NASS  
8-12-10

# Crop Production Sufficient to Meet Multiple Needs

- Ethanol production used the starch in 3.8 billion bushels of corn in 2009
  - Even then, more corn available for other uses than ever before
- Study\* found U.S. could by 2030 sustainably grow adequate biomass feedstocks to displace 30 percent of current gasoline consumption without harming food, feed or fiber production

*Source: Billion Ton Study, U.S. Departments of Energy and Agriculture*

# Higher Yields and Technology Allow Farmers to Grow More Crops on the Same Acreage

- Corn yields per acre increasing
  - 71.9 bushels per acre in 1974
  - 152 bushels per acre in 2007
  - 165 bushels per acre in 2009
- 2010 corn crop projection - 13 billion bushels

*Source: USDA National Agricultural Statistics Service*

# Most Crops Feed Livestock, Not People

- Relatively little corn grown for human consumption (less than 10 percent)
- Most U.S. agricultural production, including exports, wind up as livestock feed
- Dairy and beef cattle consume more than 70% of all calories and protein fed to livestock
- 25 million acres of corn (~5% of our cropland) could meet U.S. human demand for protein and calories
- Protein/calorie needs of livestock
  - 1,040 trillion kcal/yr (6 times human demand)
  - 56.6 trillion gm protein/yr (10 times human demand)

*Source: Dr. Bruce Dale, Michigan State University*

# Feed and Food are Co-products of Biofuel Feedstock Crops

- Biofuel production only needs part of crop
- Soy oil used to produce biodiesel
  - 80 percent of the soybean still available to produce protein-rich soybean meal
- Corn starch is used to produce ethanol
  - 1/3 of every bushel of corn used for ethanol available to produce animal feeds
- Corn ethanol coproducts - Distillers grains, corn gluten feed, corn gluten meal
  - 30.5 million metric tons produced in 2009
- Distillers Grains - high-quality livestock feed with three times as much protein and fat as corn

# Biofuels Contributed Little to Food Price Increases in 2007-08

- World Bank\* said unlikely biofuels played a significant role in food price increases
  - Biofuels represent 1.5 percent of worldwide grain and oilseed use
  - Energy prices and commodities speculation major reasons for food price increases
- “... corn prices have had little to do with rising food costs.”\*\*
- Corn prices fell in late 2008 as ethanol production increased
  - Corn prices in 2010 nearly 20 percent lower than 2009
  - Half what they were in speculative commodity bubble in summer of 2008
- Food prices continued to rise in 2008 after agricultural commodity prices dropped

\* *Placing the 2006/2008 Commodity Price Boom Into Perspective*, World Bank, Development Prospects Group, July 2010

\*\* *The Effects of Ethanol on Texas Food and Feed*, Texas A&M University, April 2008

# Real Reasons for Hunger



- From *Scientific American*, September 2007
- From p. 54, Key Concepts, The Editors
- “Farmers produce enough for everyone. But hunger persists because of political conflict, natural disasters and rural poverty.”

Source: Dr. Bruce Dale, Michigan State University



# Poverty and Hunger

- **STILL HUNGRY**
- “One eighth of the world’s people do not have enough to eat.”
- “The world produces enough food to meet the energy and protein needs of every living person.”
- “It is the unequal distribution of food among and within countries that has led to the world hunger problem.”
- “Unequal distribution has its deep root in poverty: in times of food shortages, the poor country simply cannot buy enough food in the world markets, and even when food is available inside the country, the poorest of its citizens are often unable to pay for it.”

# **Myth Number 2: We can drill our way to energy independence**

- Energy consumption expected to grow
  - U.S. - 18 percent by 2030
  - World – 49 percent by 2030\*
- U.S. imports 65 percent of petroleum today
  - By 2030, U.S. EIA estimates U.S. will import 70 percent

*Source: U.S. Energy Information Administration*

# Continued Reliance on Petroleum Puts U.S. at Risk

- “Drill, Baby, Drill” catchy slogan, but not a realistic strategy for energy independence
- Most groups, U.S. EIA and Exxon expect world oil peak in 2030’s
- Many others, including oil companies like Total Oil Co., believe it will be sooner
- Pentagon’s own analysis not optimistic...

# Milton R. Copulos

- National Defense Council Foundation president and authority on the energy needs of the military

“We have to wake up,” he said. “We are at the edge of a precipice and we have one foot over the edge. The only way to avoid going over is to move forward and move forward aggressively with initiatives to develop alternative fuels. Just cutting back won't work.”\*

- Estimates the U.S. spends more than \$137 billion a year on military operations securing oil transport from the Persian Gulf

*\* From 2007 Pentagon Study*

# The Oil Problem

Nations that **HAVE** oil  
(% of Global Reserves)

|              |           |
|--------------|-----------|
| Saudi Arabia | 26%       |
| Iraq         | 11%       |
| Kuwait       | 10%       |
| Iran         | 9%        |
| UAE          | 8%        |
| Venezuela    | 6%        |
| Russia       | 5%        |
| Mexico       | 3%        |
| Libya        | 3%        |
| China        | 3%        |
| Nigeria      | 2%        |
| <b>U.S.</b>  | <b>2%</b> |

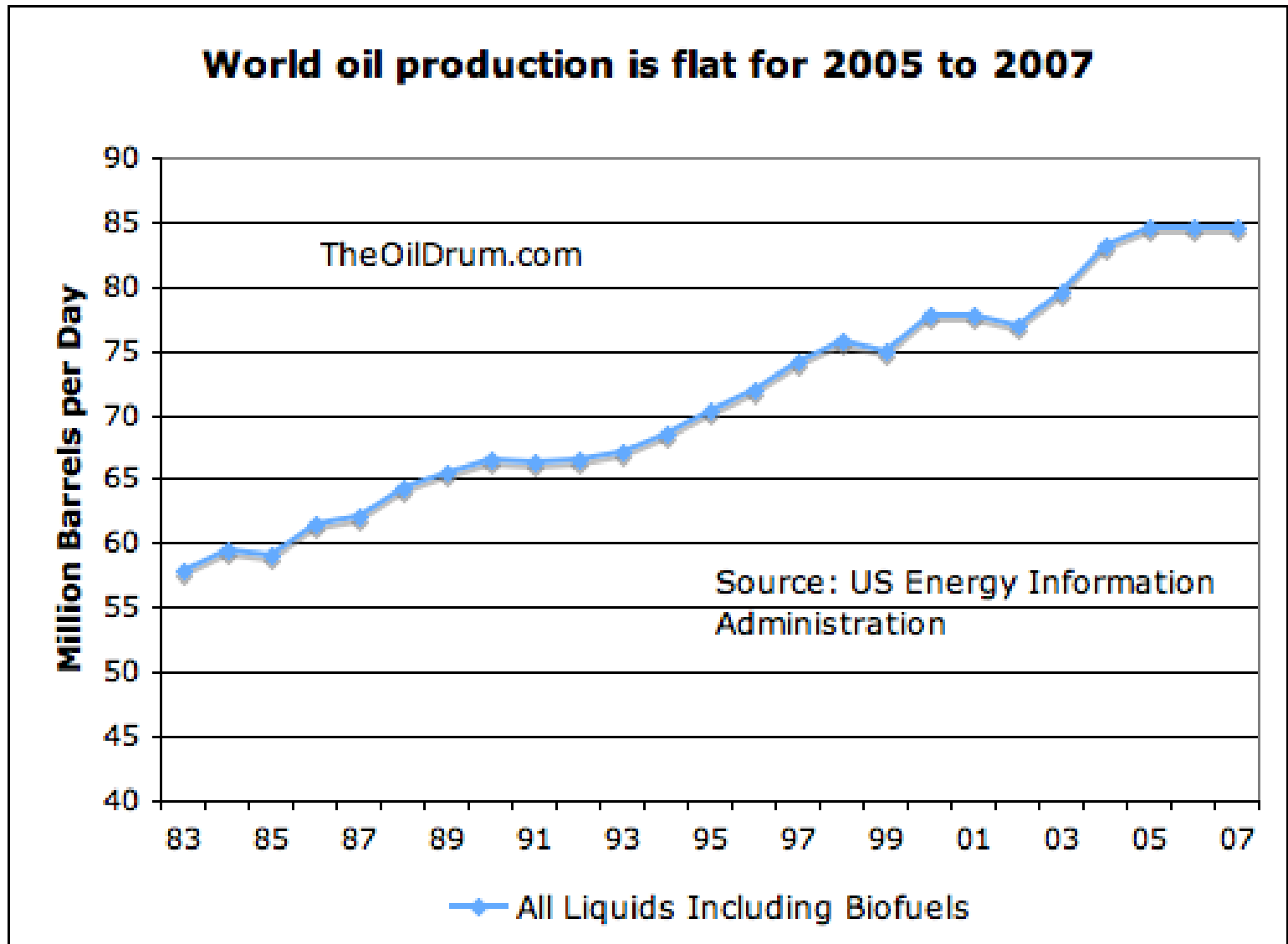
Nations that **NEED** oil  
(% of Global Consumption)

|             |            |
|-------------|------------|
| <b>U.S.</b> | <b>26%</b> |
| Japan       | 7%         |
| China       | 6%         |
| Germany     | 4%         |
| Russia      | 3%         |
| S. Korea    | 3%         |
| France      | 3%         |
| Italy       | 3%         |
| Mexico      | 3%         |
| Brazil      | 3%         |
| Canada      | 3%         |
| India       | 3%         |



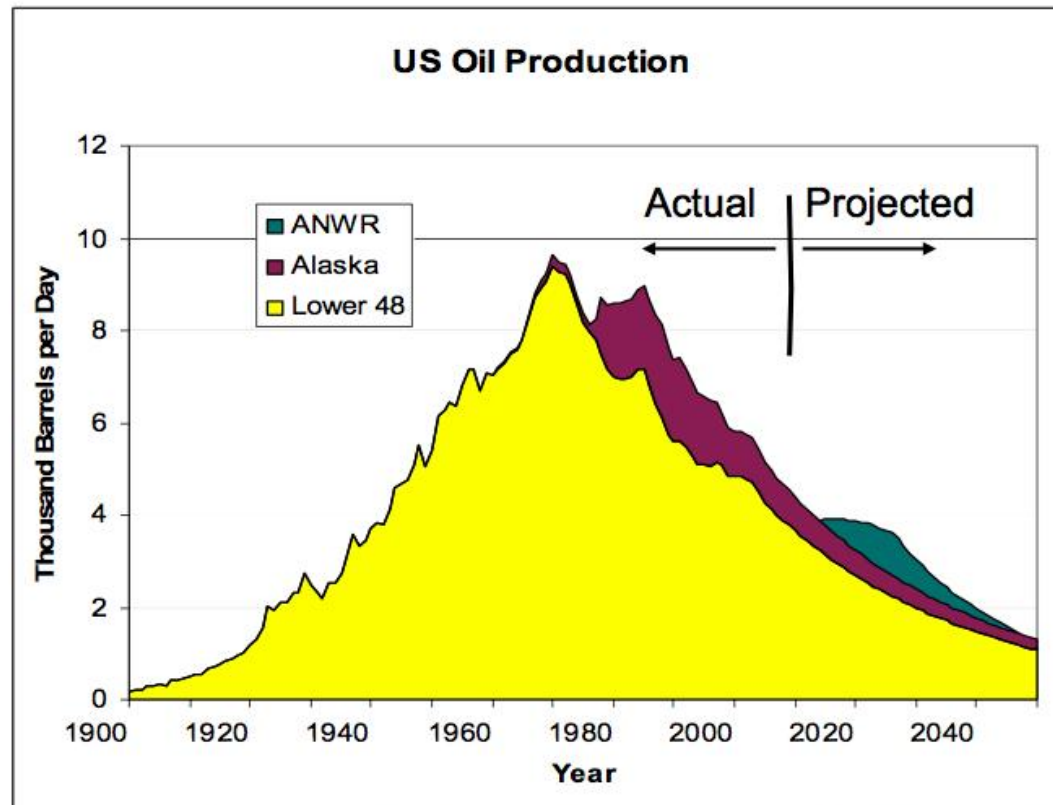
*Watch this one rise!  
2007 consumption  
over **1.5X** higher  
than 2001 levels*

# World oil production has stalled



# Drilling in Arctic National Wildlife Refuge - Not Even a Silver BB

## U.S. Oil Production



# **Myth Number 3: Cellulosic Great, Food Crops Terrible**

- Cellulosic biofuels will have many advantages
- But corn and soybeans will continue to be good choices for producing biofuels
- Biofuels, even when produced from food crops, continue to offer advantages
- Appropriate comparisons must consider all the costs and risks that accompany oil, especially imported oil



# **Myth Number 4:**

## **Biofuel subsidies unreasonable**

- Only if all government energy subsidies are wrong
  - Decades of petroleum subsidies
  - Billions to support nuclear energy
- Rationale for subsidies
  - Public benefits of biofuels
- Biofuels help reduce farm payments
  - Farm payments expected to be reduced about \$6 billion, USDA Chief Economist, January 2007
- Comparison to petroleum subsidies

# Petroleum vs. Renewables Subsidies

- Global subsidies for fossil fuels 12 times those for renewables\*
  - \$43 to \$46 billion for wind, solar and biofuels
  - \$557 billion for petroleum and other fossil fuels in 2008\*\*
- General Accounting Office (GAO) found that the U.S. spent more than \$130 billion over 32 years in oil industry subsidies\*\*\*
  - Does not include military expenditures

\* *Bloomberg New Energy Finance, July 2010*

\*\* *International Energy Agency, June 2010*

\*\*\* *GAO/RCED-00-301R*

# Myth Number Five:

## Energy Balance of Biofuels

- Myth – It takes more energy to produce biofuels than they contain.
- Energy balance for corn ethanol is at least 1.4-1 and improving
- Most researchers find that corn ethanol has positive energy balance
- Cellulosic biofuels will have an even better energy balance
- Biodiesel has a very attractive energy balance

# Energy Balance for Corn Ethanol

- Corn agricultural inputs going down
  - Nitrogen use down 20 percent since mid-90's
  - Direct energy inputs down 50%
- Ethanol yields increased 10% in 20 years
- Ratio of energy in ethanol to the external energy used to produce ethanol is about 1.4\*
- After allowing for heat used to produce byproducts, energy ratio is between 1.9 and 2.3\*

*\*2008 Energy Balance for the Corn-Ethanol Industry, USDA, June 2010*

# Energy Balance Estimates for Corn Ethanol Vary

- Most researchers found that corn ethanol has positive energy balance
  - Pimentel & Patzek the consistent outliers
  - Review of their data by Michael Wang of Argonne (author of GREET) found
    - Significantly outdated information on agricultural inputs
    - Invalid assumptions



# **Biodiesel Has Very Strong Energy Balance**

- Biodiesel's energy balance has increased in just 10-15 years from 2.5 to 4.5
- The best energy balance of any currently available American-produced fuel

# Fossil Energy In vs. Energy Out as Fuel: Basis

What you get as output for every 1 unit of fossil energy input over the upstream life cycle:

Fossil-fuel energy used to make the fuel (input) compared with the energy in the fuel (output)

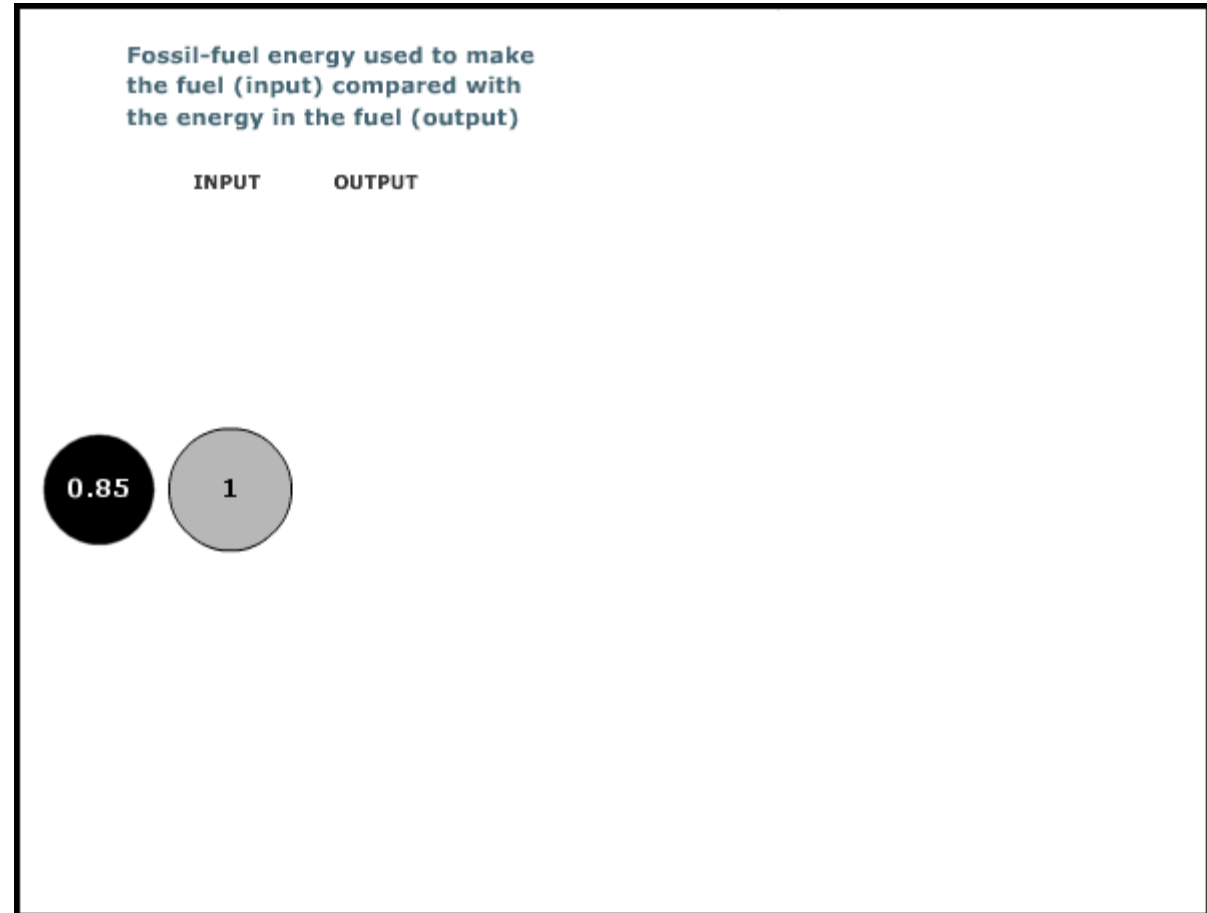
INPUT

OUTPUT

1

# Fossil Energy In vs. Energy Out as Fuel: Gasoline & Diesel

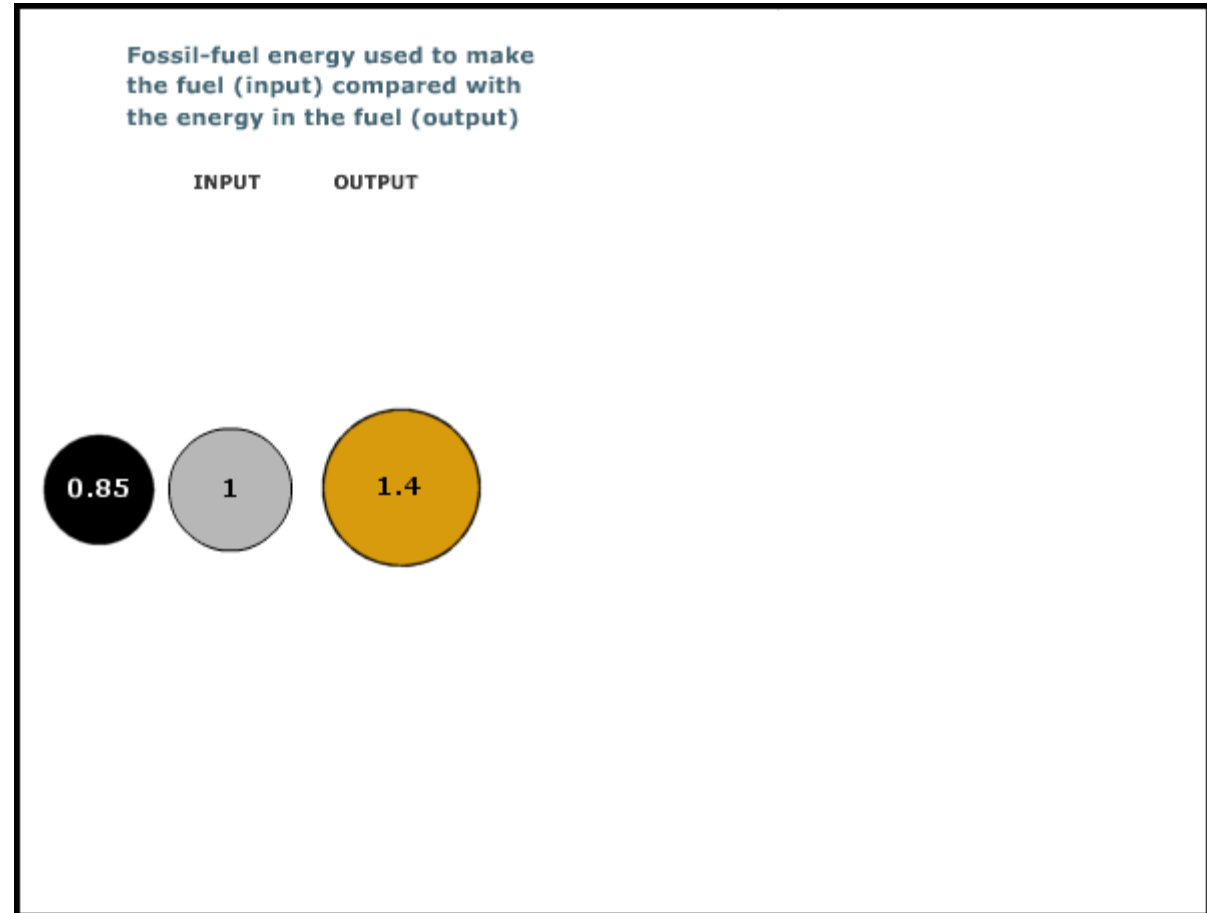
What you get as output for every 1 unit of fossil energy input over the upstream life cycle:





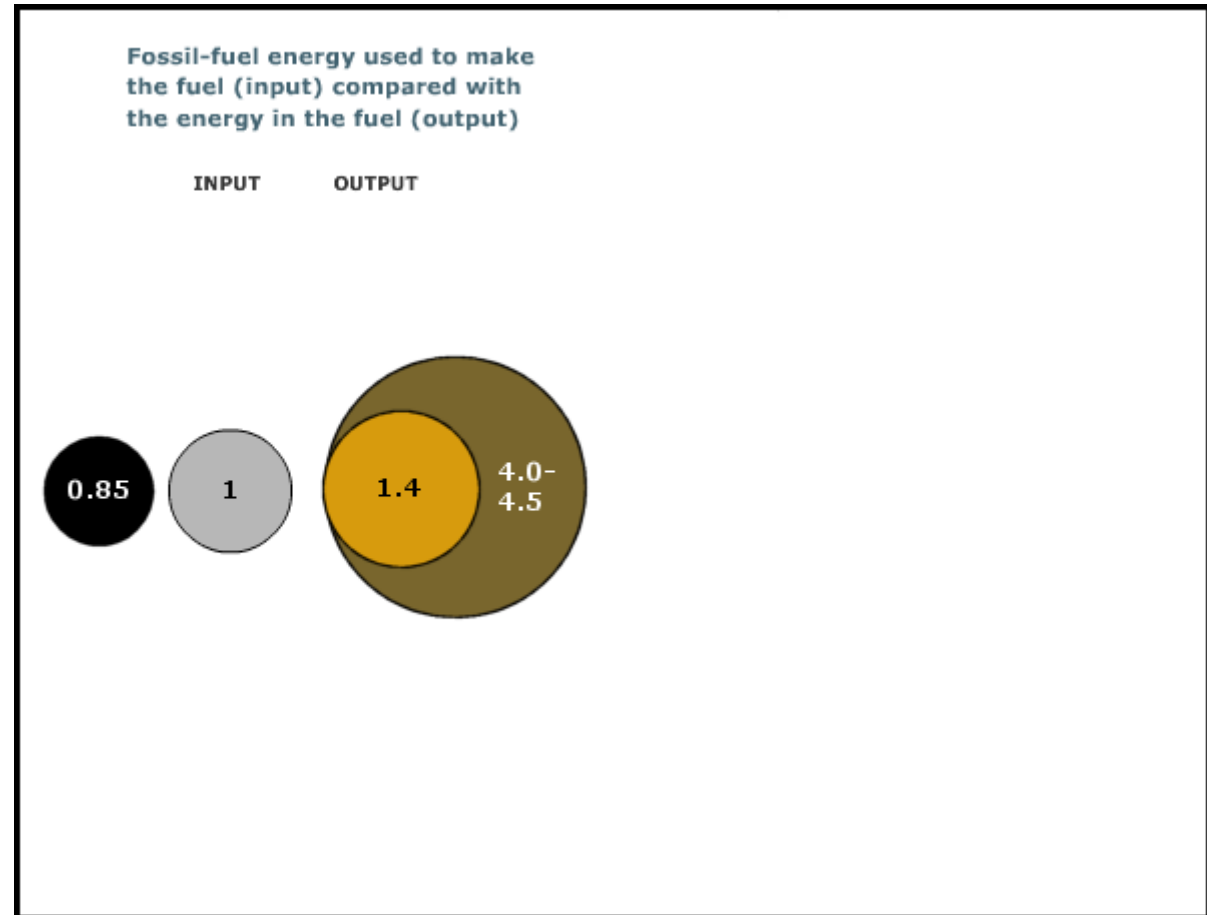
# Fossil Energy In vs. Energy Out as Fuel: Corn-based Ethanol

What you get as output for every 1 unit of fossil energy input over the upstream life cycle:



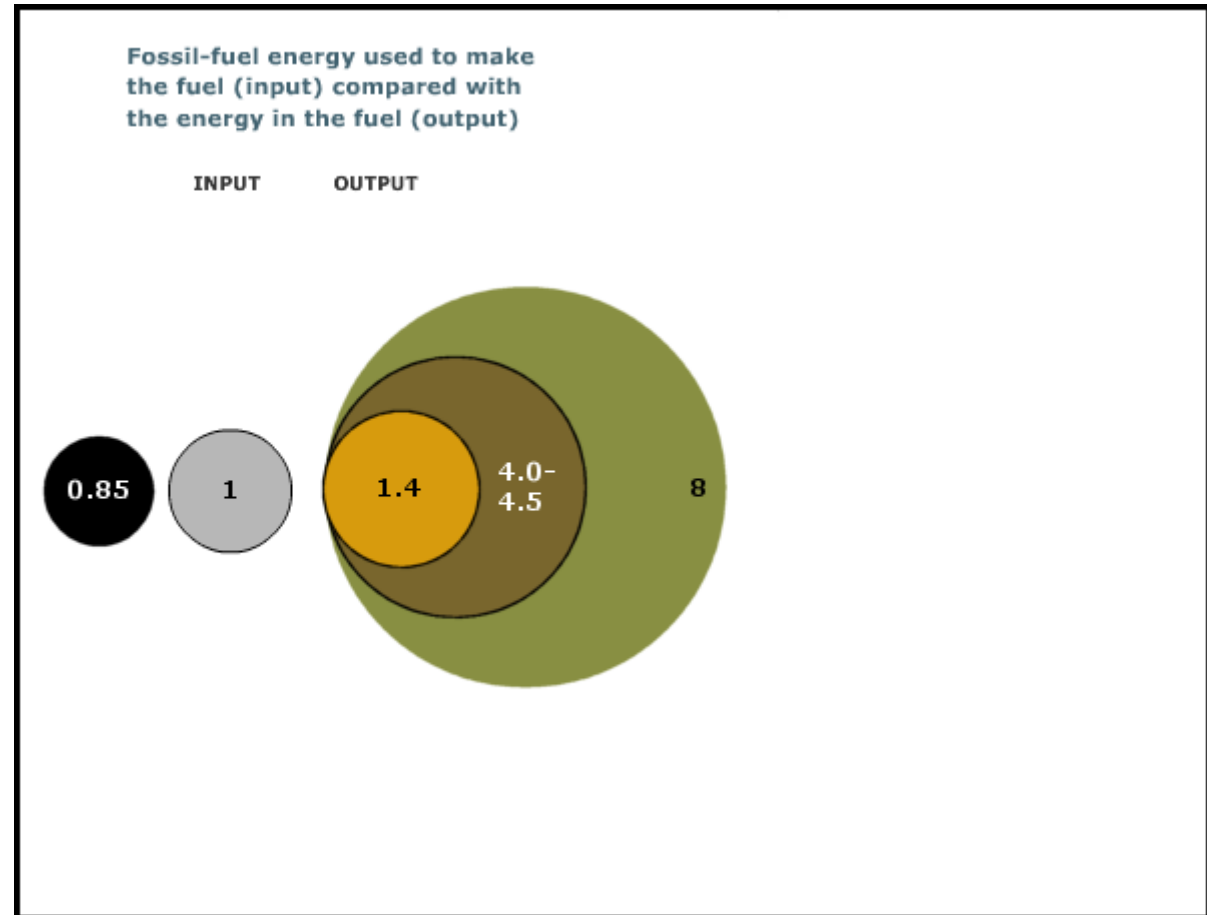
# Fossil Energy In vs. Energy Out as Fuel: Today's Biodiesel

What you get as output for every 1 unit of fossil energy input over the upstream life cycle:



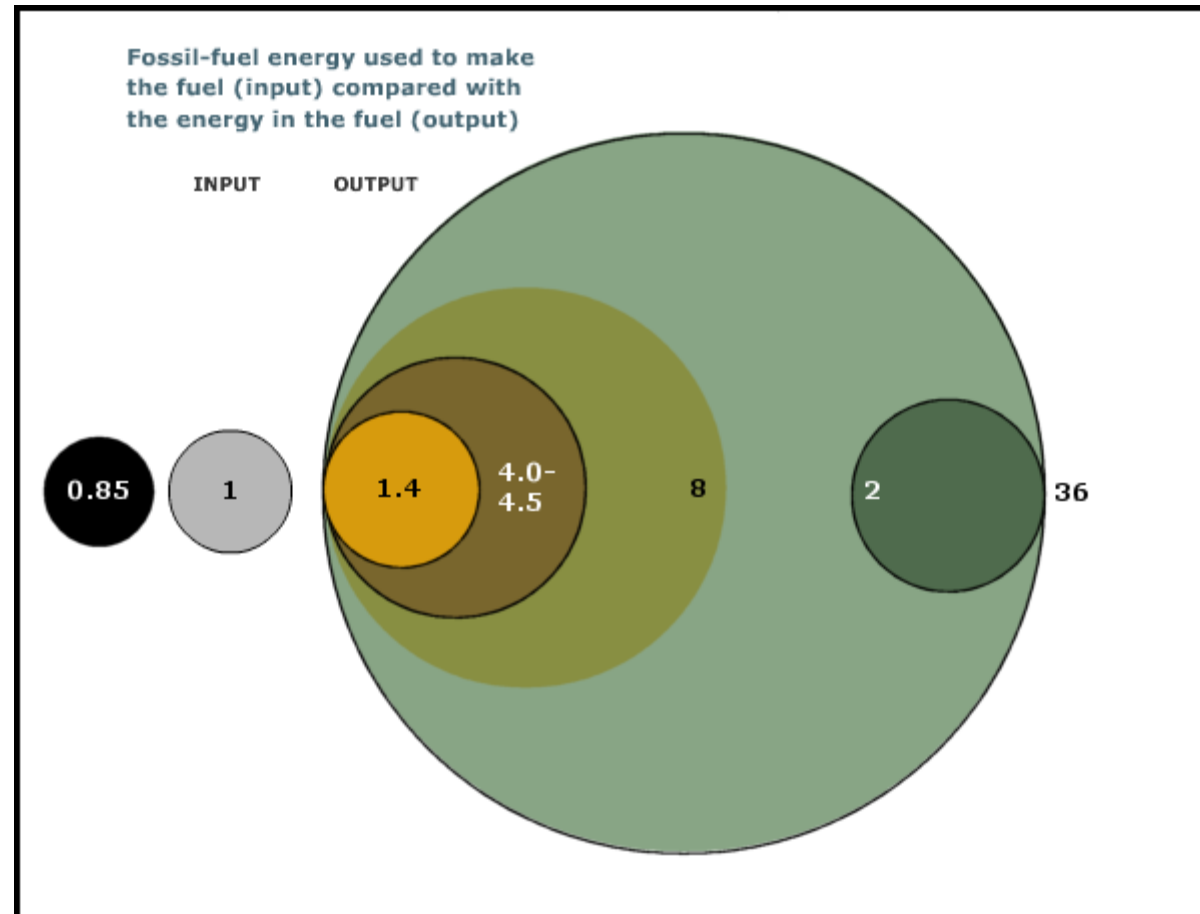
# Fossil Energy In vs. Energy Out as Fuel: Sugarcane Ethanol

What you get as output for every 1 unit of fossil energy input over the upstream life cycle:



# Fossil Energy In vs. Energy Out as Fuel: Cellulosic Ethanol

What you get as output for every 1 unit of fossil energy input over the upstream life cycle:



# Myth Number 6: Biofuels do not improve air quality

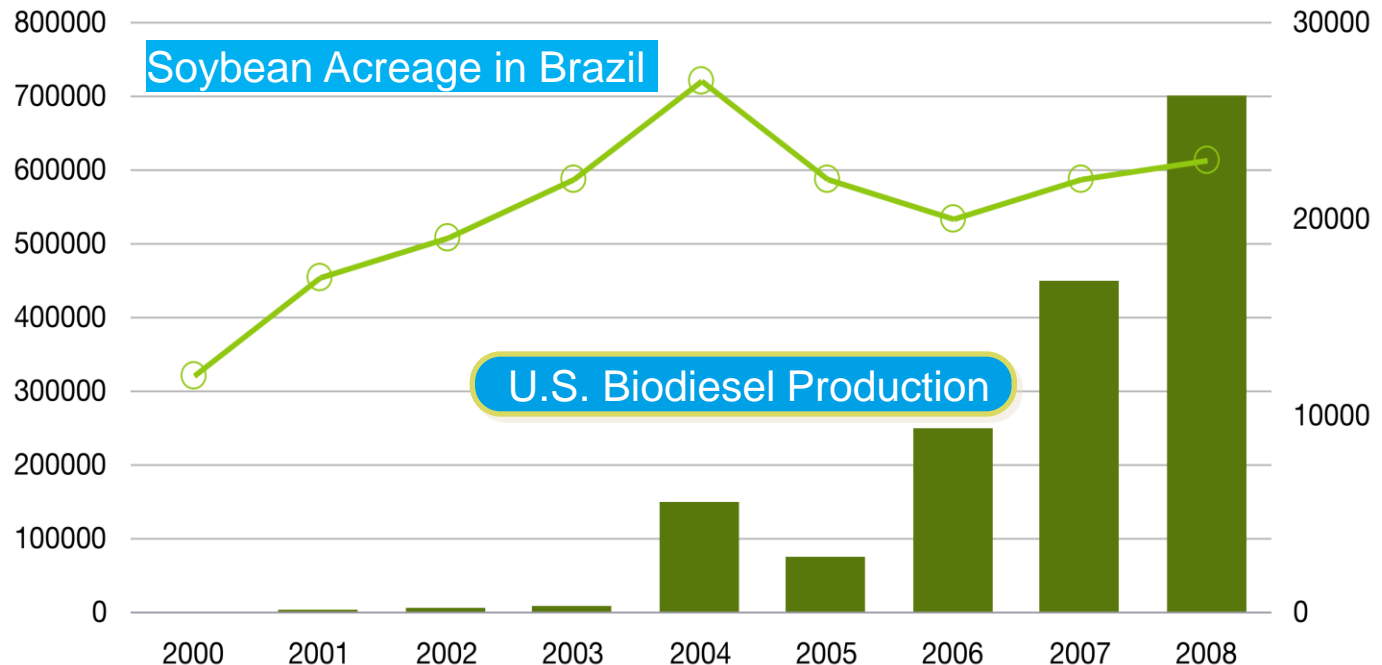
- Generally, the use of biofuels creates less air pollution than the use of petroleum fuels
  - Biodiesel – Almost all pollutants down; NO<sub>x</sub> can be slightly up or down
  - Ethanol\* – HC total, NO<sub>x</sub>, PM, CO down, acetaldehyde, butadiene up (ethanol-*optimized* vehicles can further reduce these emissions)
  - GHG, B20-B100 – 15-75% reduction
  - GHG, E85 – 20% reduction from corn; as high as ~75% from cellulosic ethanol

Source: Alternative Fuel Data Center, U.S. Dept. of Energy

# Myth Number 7: Indirect Land Use

- EPA's theory in RFS2 proposal
  - Increased U.S. biodiesel production will lead to land conversion in South America
  - U.S. biodiesel production increased from 25 million gallons to 690 m/gallons from 2004-08
  - From 2004-2008, soybean acreage in Brazil declined
- Small share of total world cropland used to produce grain for ethanol production
  - 0.6 – 0.9 percent of global cropland use needed for U.S. ethanol industry
  - Ethanol not significant driver of land use decisions

# Brazil Soybean Acreage



- Data (From NBB) show that **land area used for soybean production in Brazil actually decreased** between 2004 and 2009, while U.S. biodiesel production climbed to 700 million gallons a year.
- Deforestation rate in Brazil (thanks to new policies, practices): 2004 - 26k km<sup>2</sup>/yr; 2009 - 7k km<sup>2</sup>/yr (*Imazon*)

# Thank You

Alan Jones

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# Ralph Boroughs

**-Tennessee Valley Authority-**

**-Project Manager-**





# Getting Ready for Plug-In Electric Vehicles

Tennessee Alternative Fuels &  
Bioenergy Conference

August 15, 2010

Ralph Boroughs



# Outline

- Plug-In Vehicles are Coming to Tennessee
- Why does TVA Care?
- What are we doing?
  - Infrastructure Studies
  - SMART Charging Station
  - Nissan / Ecotality ARRA (Stimulus) Project
- Next Steps



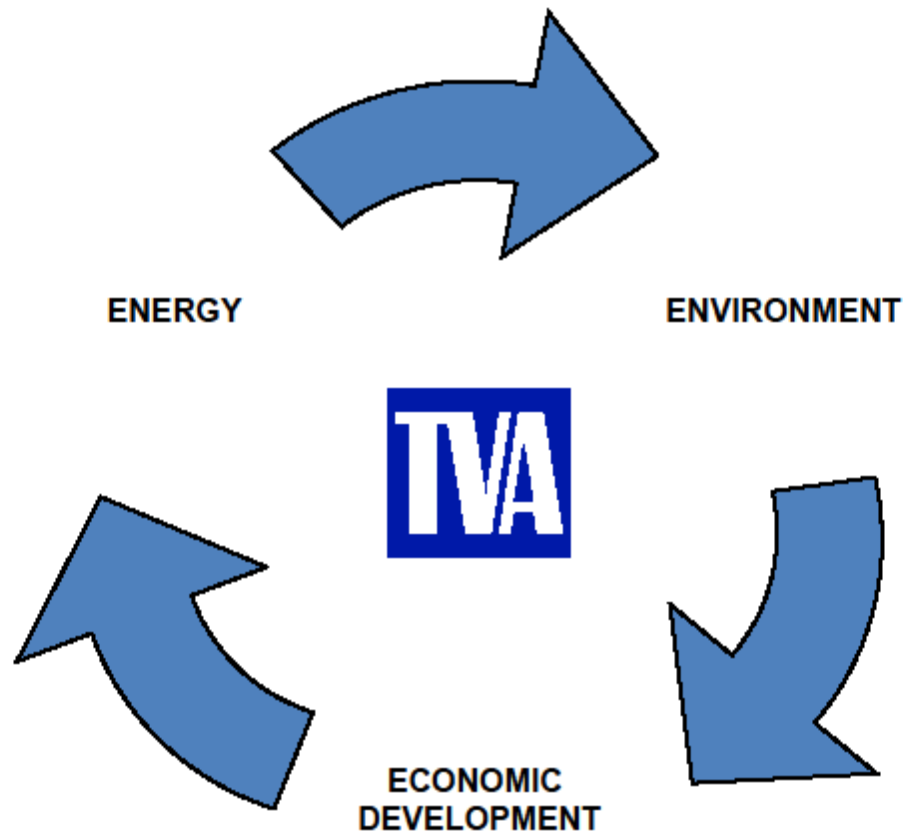
## Plug In Vehicles are Coming

- Nissan Leaf™- 2010 to Tennessee
- Chevrolet Volt™- 2010, selected states  
2011 to Tennessee
- Mitsubishi iMiev™ -2011
- ALL major automakers now have an electrification strategy, each different



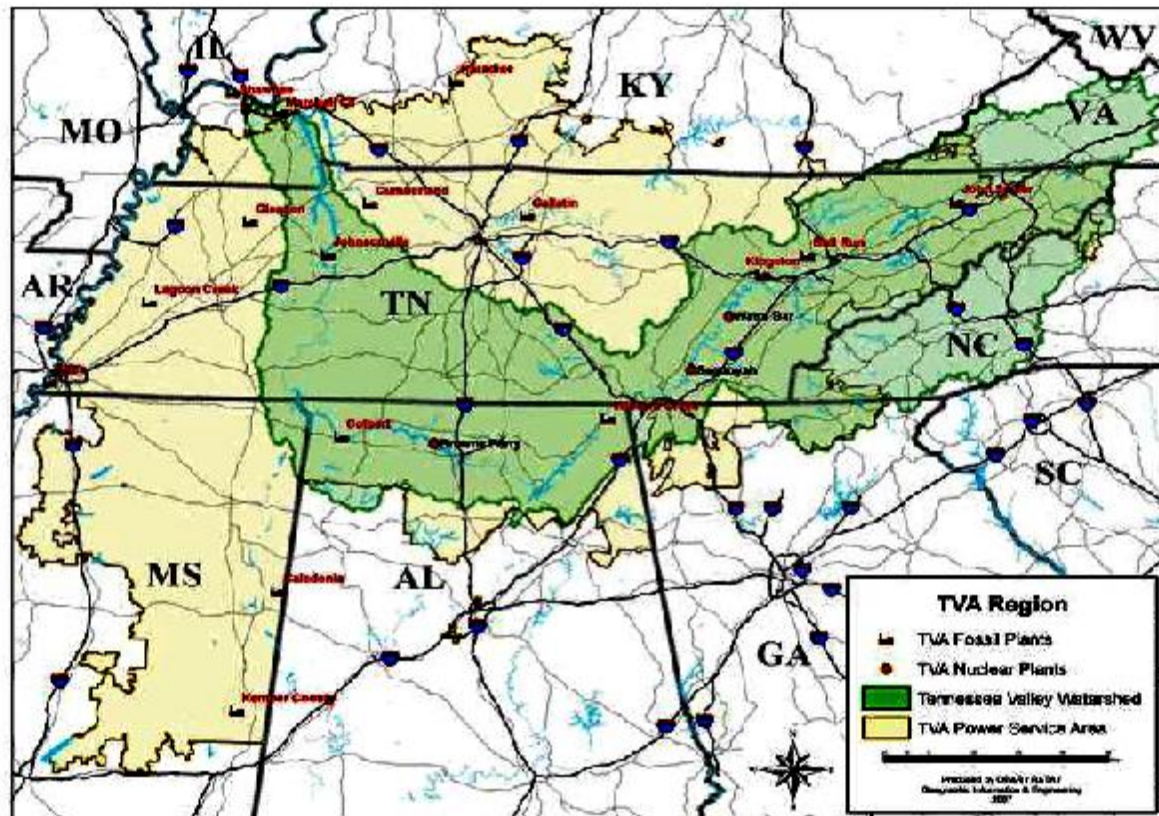
## How Do Plug In Vehicles (PEVs) Affect TVA's Core Missions?

- **Energy**
  - Potential Threat if poorly managed
  - Potential Benefit if well managed
- **Environment**
  - Net Reduction in Greenhouse Gas Emissions
  - Net Reduction in  $\text{SO}_x$ ,  $\text{NO}_x$ , Volatile Organics
- **Economic Development** –
  - Use domestic vs. foreign energy resources
  - Less dollar drain, more useful income
  - Emerging technologies support job creation





# TVA Region





## Automakers in TVA Region

- Nissan – Franklin, Smyrna, Decherd TN
- GM - Spring Hill TN
- Toyota - Mississippi
- Volkswagen – Chattanooga, TN





## Related Initiatives & Projects

- Infrastructure Studies
- SMART Charging Station
- Nissan Leaf /Ecotality Infrastructure  
ARRA (Stimulus) Project



## TVA / EPRI Grid Impact Research

- Model Selected Circuits
  - Middle Tennessee EMC
  - Nashville Electric Service
  - Knoxville Utilities Board
  - Chattanooga Electric Power Board
- Deterministic and Probabilistic Scenarios
- Study system impacts



## Key Findings to Date

- Impacts are Localized
- Grid upgrades may be required
- Greatest Impact –Transformer Life
- Consumer Incentives needed to drive smart charging



# TVA SMART Station

## Smart Modal Area Recharge Terminal



Nissan LEAF



Chevy Volt by GM



Mitsubishi i-MiEV

- The "TVA SMART Station" project is managed through EPRI.
- Links solar power, stationary batteries, electric vehicles and smart controls to the power grid.
- TVA, EPRI and the Oak Ridge National Laboratory (ORNL) will use the design at several Tennessee sites.
- Other participants include:
  - State of Tennessee
  - Nissan North America
  - Chattanooga (City, EPB)
  - Knoxville (City, KUB)
  - Nashville (City, NES, MTEMC)





## Nissan LEAF – December 2010

### Initial Launch Markets

- California – San Diego
- Oregon – Portland, Eugene, Corvallis
- Washington – Seattle
- Arizona – Phoenix, Tucson
- Tennessee –
  - Chattanooga
  - Knoxville
  - Nashville



# Ecotality / Nissan Infrastructure Project

- Tennessee Partnership coordinated through Ecotality\* - submitted proposal to DOE on May 13, and award announced on August 7, 2009
  - Deploys up to 1000 Nissan electric vehicles in Tennessee
  - Provides charging infrastructure with each Nissan vehicle (home, work/public)
  - \*\*Links Chattanooga, Knoxville and Nashville with rapid charge network

States in proposal: AZ, CA, OR, TN & WA



Charging Infrastructure Locations



Nissan LEAF

Project Website: <http://www.theevproject.com/>

\*Electric Transportation Engineering Corporation in conjunction with Nissan North America

\*\*\$100 Million for Electric Vehicle Deployment in U.S., 8/7/09, <http://www.metering.com/100/million/dollar/electric/vehicle/deployment/US>



## Next Steps

- Develop a Valley Wide strategy for Electric Transportation
- Continue Impact Analysis
- Investigate Smart Charging Technologies
- Deploy Solar Charging Systems
- Coordinate with Nissan & Other Automotives
- Coordinate with Ecotality on Charger Deployment
- Support Power Distributor Needs

# THANK YOU



Contact: Ralph Boroughs

[rdboroughs@tva.gov](mailto:rdboroughs@tva.gov)

423-751-4644



# Stephanie Cox

**-Ecotality North America-**



# Infrastructure is Coming...



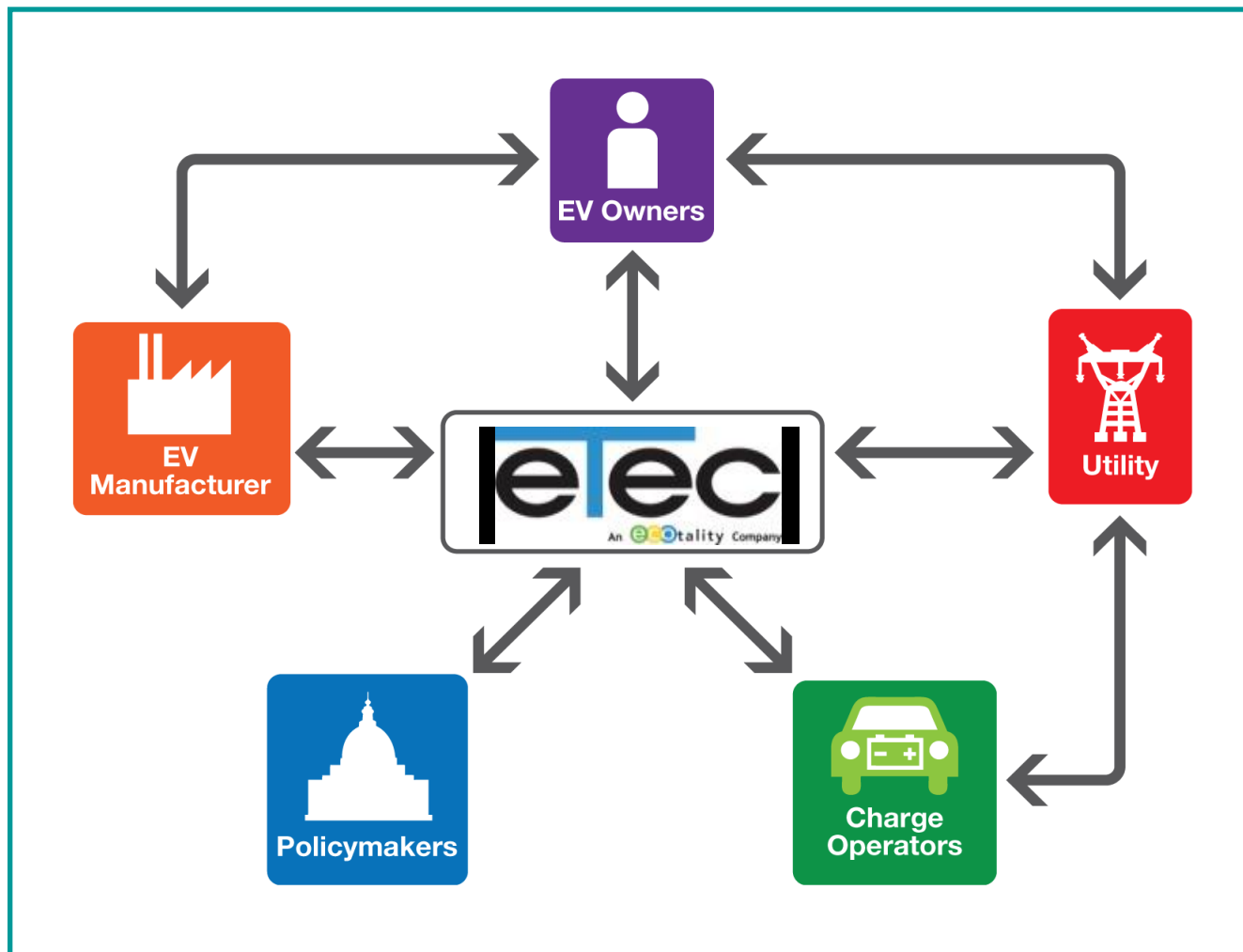
## Electric Vehicle Infrastructure Demonstration & Evaluation Program

- \$230 million project: American Recovery & Reinvestment Act
  - \$99.8 million grant from the DOE
  - \$15 million additional grant funding and project expansion
  - additional project expansions proposed
- *Purpose:* **To build and study** a mature electric vehicle charging infrastructure
- *Product:* **Lessons Learned**

- Arizona
  - Phoenix
  - Tucson
- California
  - Los Angeles
  - San Diego
- Oregon
  - Corvallis
  - Eugene
  - Portland
  - Salem
- Washington
  - Seattle
- Tennessee
  - Chattanooga
  - Knoxville
  - Nashville
- Texas
  - Dallas
  - Fort Worth
  - Houston
- Washington D.C.



Charging Infrastructure Locations





# Advisory Boards



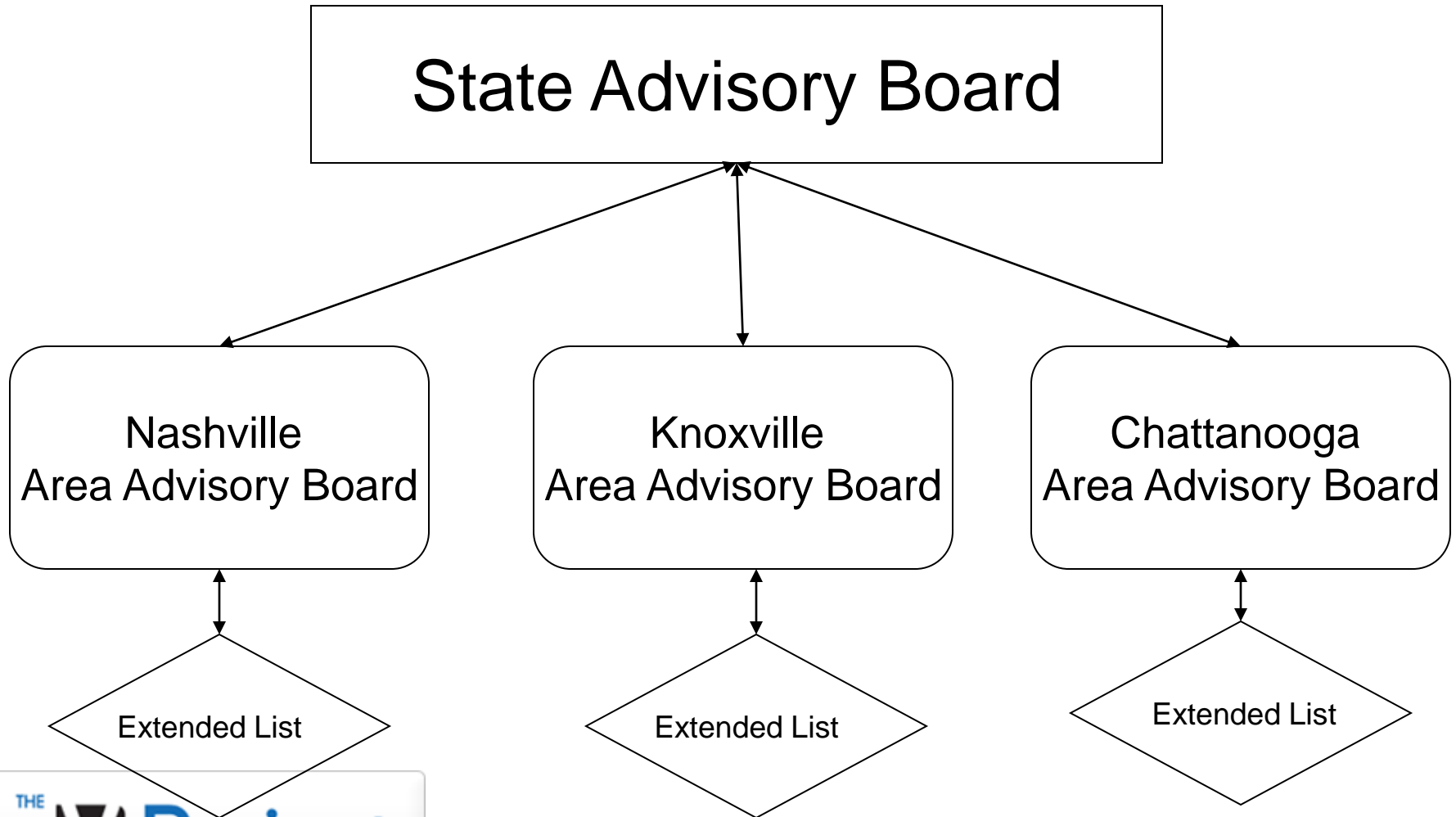
Middle Tennessee Electric  
Membership Corporation



CITY OF KNOXVILLE



# Stakeholder Chart



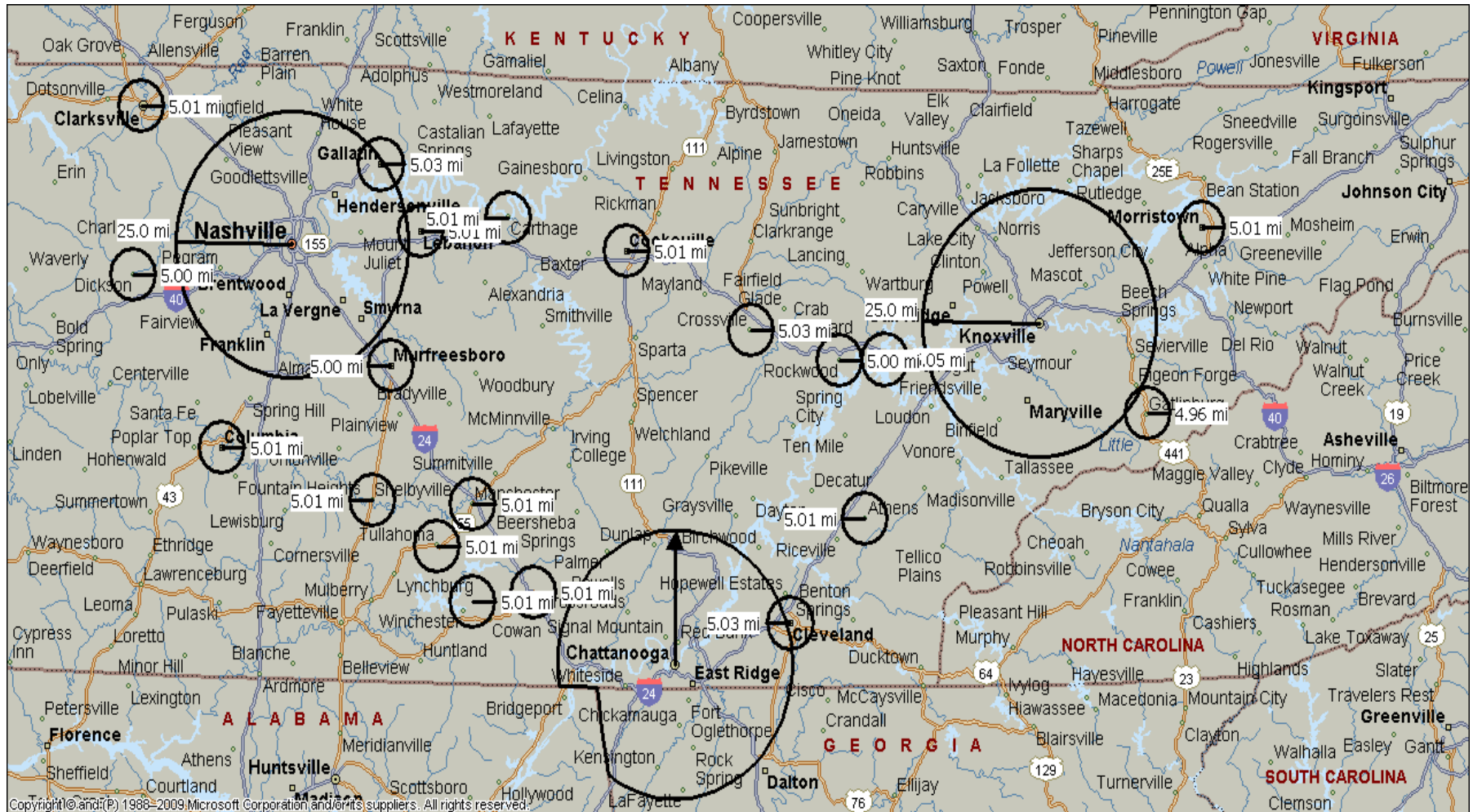
# *Schedule for Project*

|   |                             |
|---|-----------------------------|
| Organize Stakeholders                     | March                       |
| Regularly Scheduled Meetings & Committees |                             |
| Deployment Guidelines                     | April                       |
| Version 3.0 Final                         |                             |
| EV Infrastructure Long Range Plan         | July                        |
| 10- Year Plan                             |                             |
| Implementation Plan                       | August                      |
| Installation Plan                         |                             |
| EVProject Roadmap                         | July – October              |
| Specific Charger Locations                |                             |
| Install Commercial, City & State          | November– June '11          |
| Install Residential & DC Fast Chargers    | Dec. – June '11             |
| Install DC Fast Chargers                  | December – June '11         |
| Data Collection                           | December '10 – December '12 |
| Final Report                              | June 13                     |



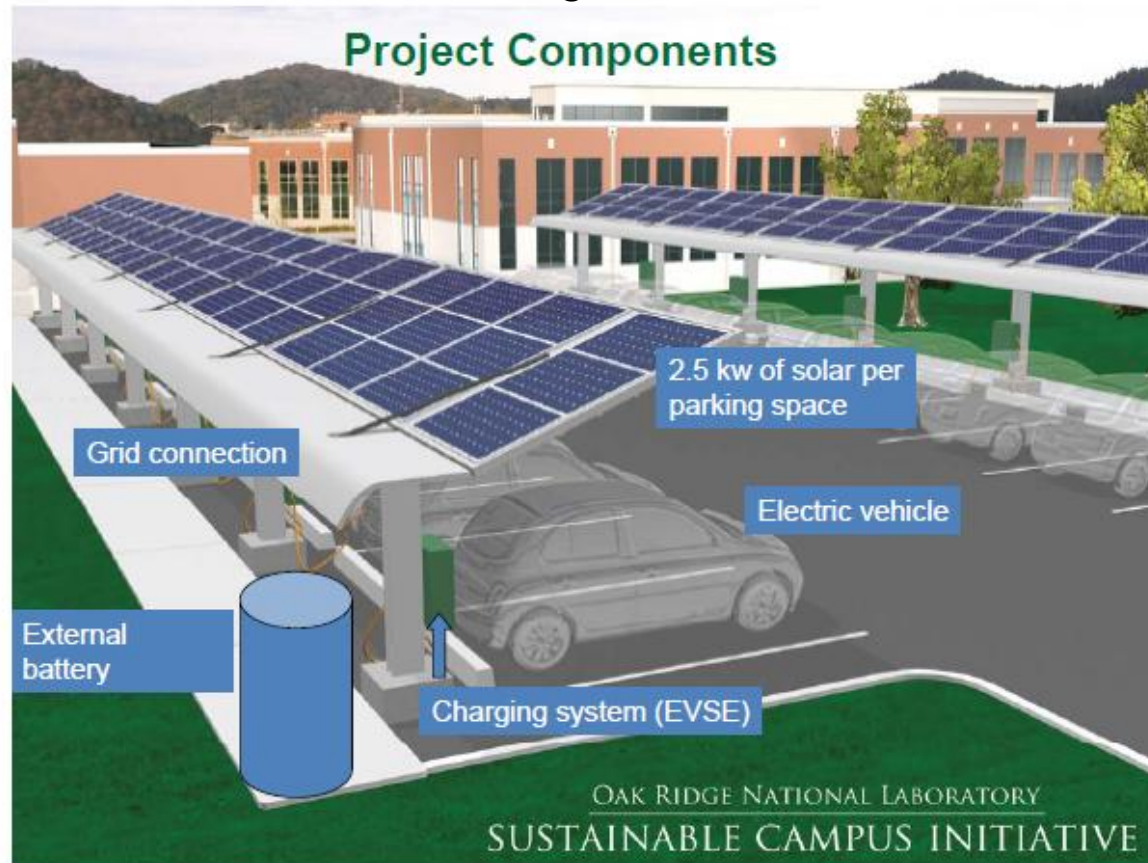
| Hardware Infrastructure      | Tennessee |
|------------------------------|-----------|
| Level 2 Vehicle Participants | 1000      |
| Level 2 Commercial           | 1200      |
| Level 2 Public               | 150       |
| DC Fast Charging             | 60        |
| Solar Charging Stations      | 125       |

- Tennessee has the most infrastructure in the EVProject

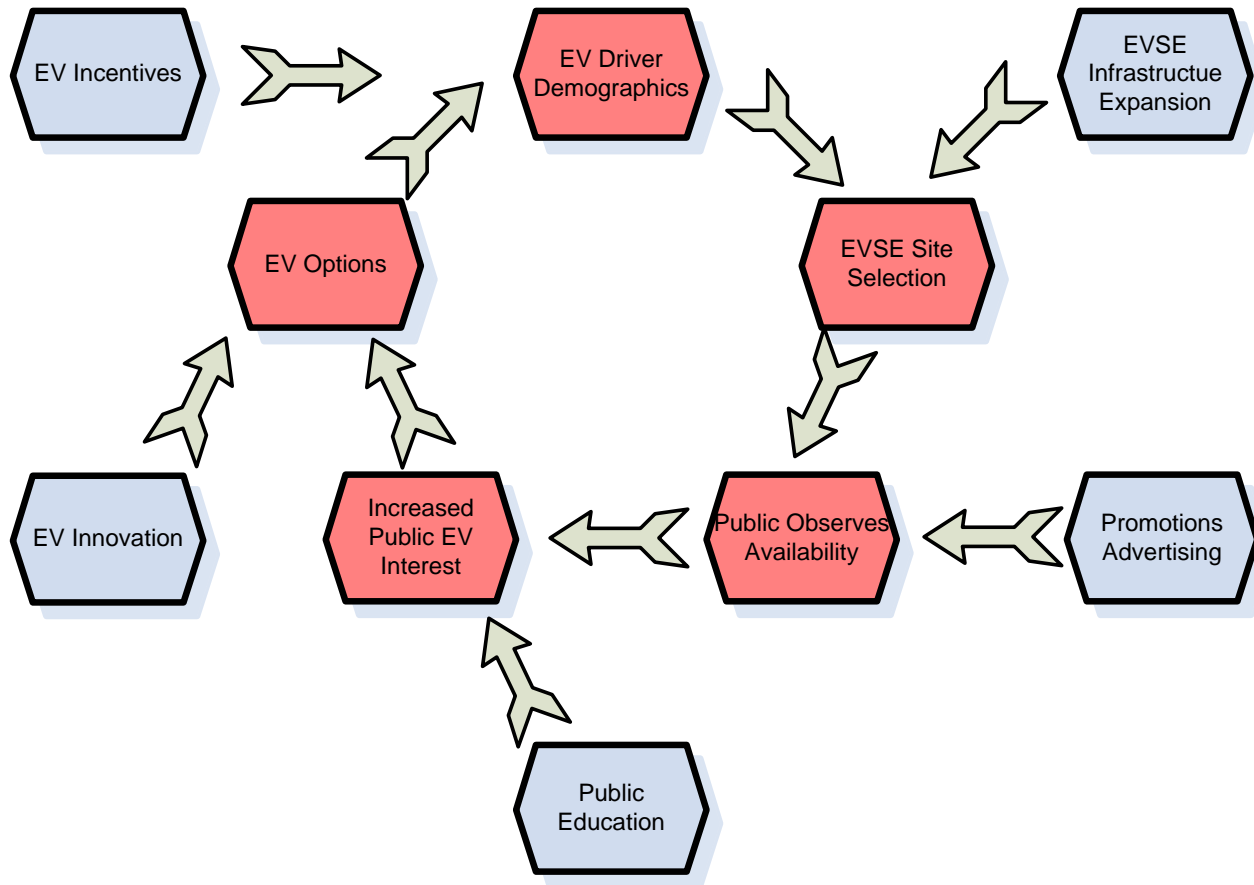


Tennessee has the largest geographic area.

## Solar Modular Area Recharge Terminal: SMART Station



# Purpose of infrastructure?



Extend the range of  
the vehicle

Relieve Range Anxiety

Encourage Wide  
Spread EV Adoption



*J1772*

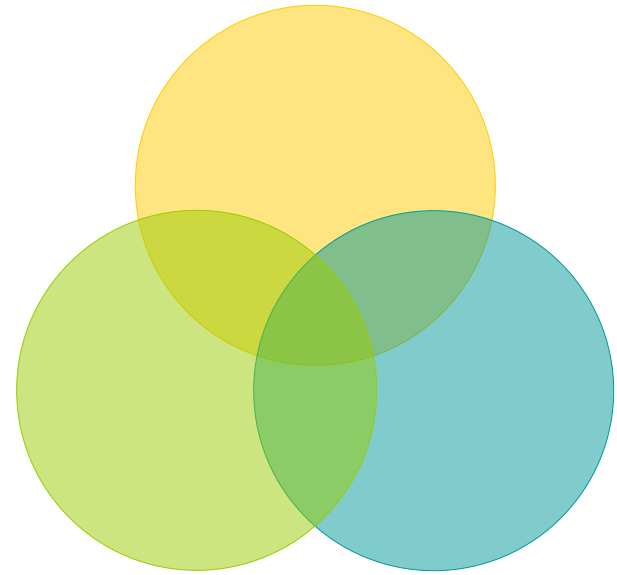
*Society of Automotive Engineers Standardized Connector  
SAE*



DC Fast Charging Connector



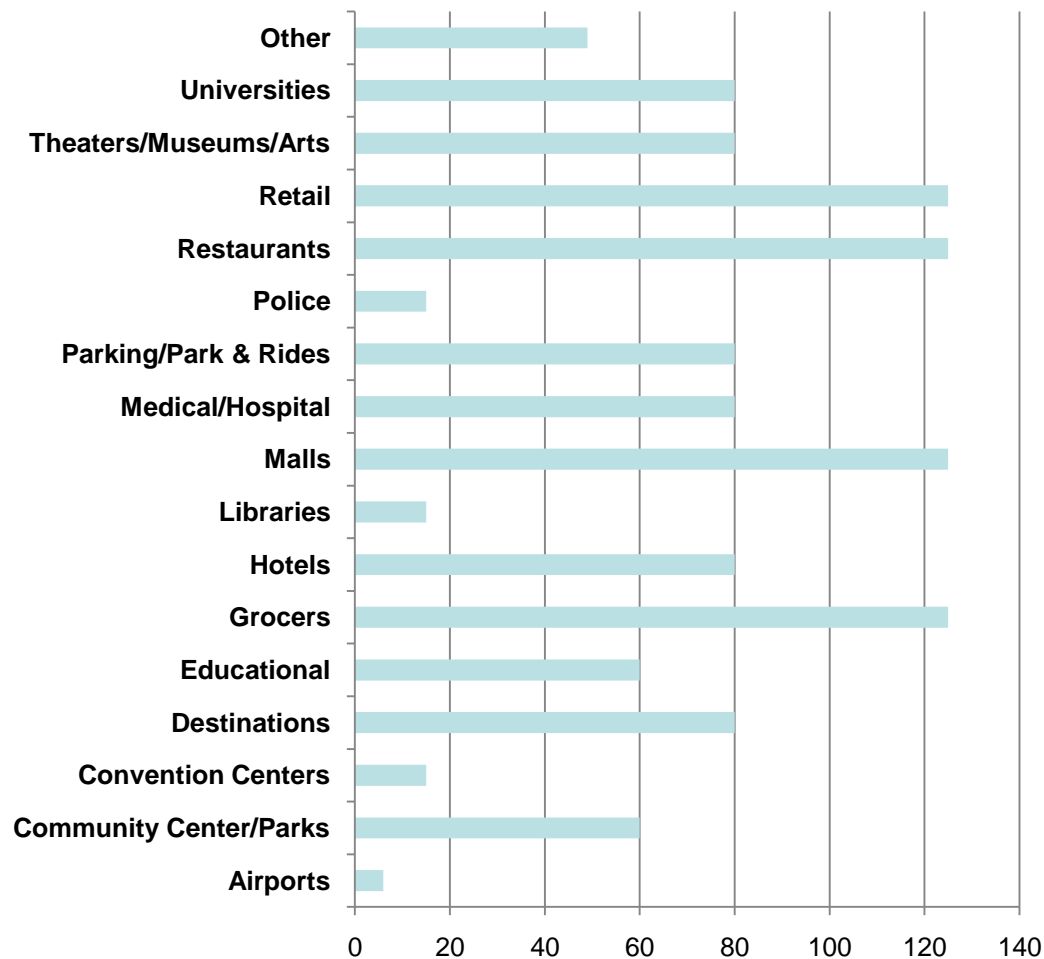
# Hardware Infrastructure Designations



**Diversity of Choice  
Lessons Learned  
Best Practices**

| Location Type          | Target EVSEs |
|------------------------|--------------|
| Airports               | 6            |
| Community Center/Parks | 60           |
| Convention Centers     | 15           |
| Destinations           | 80           |
| Educational            | 60           |
| Grocers                | 125          |
| Hotels                 | 80           |
| Libraries              | 15           |
| Malls                  | 125          |
| Medical/Hospital       | 80           |
| Parking/Park & Rides   | 80           |
| Police                 | 15           |
| Restaurants            | 125          |
| Retail                 | 125          |
| Theaters/Museums/Arts  | 80           |
| Universities           | 80           |
| Other                  | 49           |

## Target EVSEs





# Residential Hosting Partnerships

- *Nissan Customer Journey*
  - *Qualification Process*
    - *Miles Driven*
    - *Low Cost Installation*
- *Agreement*
  - *Notification of Utility – this is not happening outside of the EVProject*
    - *Data delivery*

# Commercial Hosting Partnership

- *Programs based upon location type*
  - *Hospitality Program*
    - *10 Hotels per core project city and 2 EVSE per*
    - *5 other locations with 2 hotels per and 2 EVSE per*
  - *Foodservice Program*
    - *Restaurants: 2 EVSE ea and possibly 1-2 DC Fast Charger*

# Electric Vehicle Infrastructure Growth Plan

- *Utilization Rates*
  - 25%
  - 50%
- *Reserved Parking*
  - *Employee*
  - *Guests Only*

# Project Process



*Media Outreach*

*Orientation*

*Launch*

*Installation*

*Construction Contract*

*Conditional Agreement*

*Site Assessment*

*Letter of Intent Executed*

# Infrastructure is Here...



## Electric Vehicle Infrastructure Demonstration & Evaluation Program



**SAVE THE DATE**

**Level 2 Infrastructure**

**Design Reveal and Pricing Release**

Plug-in 2010

July 27 at 9:45 AM

Location: ECOtality Booth,

Booth #420

**PLUG-IN**  
**2010** 



209 10<sup>th</sup> Avenue South

Suite 510

Nashville, TN 37203

(615) 504-4928

# Jim Coker

**-Heritage Propane-  
-Manager of Engine Fuels-**





**Real Propane Fuel Solutions.**

Go Green. Save Green.

# Metro Lawn



A Division of Heritage Propane

## Real Propane Fuel Solutions

*Fuel Program!*

## Go Green. Save Green.

**Real Propane Fuel Solutions.**

Go Green. Save Green.

# Propane Powered Commercial Mowers



# Lawn Care Pollution

The federal Environmental Protection Agency estimates there are 89 million pieces of lawn and garden equipment in the United States with engines rated at 25 HP or less.

Garden Equipment engines emit high levels of carbon monoxide, volatile organic compounds and nitrogen oxides, producing up to **10% of the NATION'S air pollution**

## A Typical 3.5 HP Gas Mower

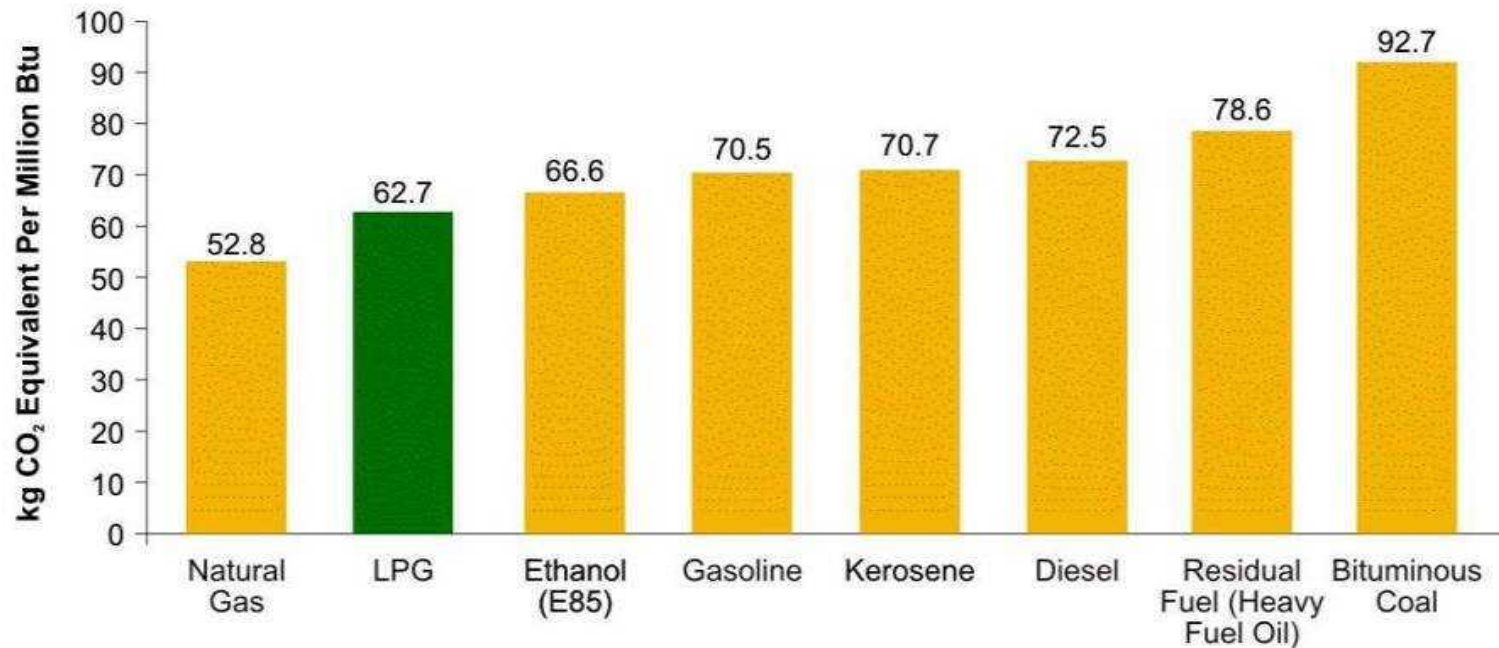
- Can emit the same amount of VOC's in an hour as a new car driven 340 miles. A recent California Air Resource Board report shows lawn mowers statewide emit 8.28 tons of VOC's per day.
- Lawn equipment users inadvertently add to the problem by spilling 17 MILLION gallons of fuel each year while refilling their equipment -----

***MORE THAN SPILLED BY THE EXXON VALDEZ!***



# Carbon Emissions

## On-Site Carbon Emissions for Various Fuels



**Real Propane Fuel Solutions.**

Go Green. Save Green.

90 Clean Cities Coalitions



**U. S. Department of Energy**

# Dependency on Foreign Oil 2009

[www.PickensPlan.Com](http://www.PickensPlan.Com)

7 Billion Barrels (1-Barrel of oil = 42gal)

95 Billion Gallons of Gasoline (1 Barrel = 20gal)

\$260 Billion Dollars (500 mil per minute)

Nearly 70% Imported

US uses 23% of the World's Oil (3% of population)



**Real Propane Fuel Solutions.**

Go Green. Save Green.

**Reduce your carbon footprint while saving yourself money and using more American fuels!**





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## Manufacturer's Now Offering



## Benefits of Propane Powered Commercial Mowers

- ✓ Reduces toxic Green House Gases (*GHG*) by + 30%
- ✓ 80%-96% **reduction in toxic carcinogens** emissions in the air
- ✓ Propane burns cleaner/ No carbon build-up on valves
- ✓ Reduces the **carburetor maintenance** due to poor fuel
- ✓ **Extended oil life** means less time changing oil & filters
- ✓ Not subject to "**Ozone Action Days**" (*No lost labor hours*)

## Benefits of Propane Powered Commercial Mowers

- ✓ **No leaks** during fill ups (*unlike gasoline*)
- ✓ **No shrinkage** (*employees can not "**borrow**" propane to run their trucks*)
- ✓ Propane tanks are certified by the DOT for 12 years
- ✓ Propane averages 10%-20% less expensive than current gas prices
- ✓ Over **90% of propane is domestically produced**

## Support from the Propane Industry

- *Customer Loyalty Starts With The Customer Having A Good Experience And Support From The Product They Purchase*
- *Don't Leave It To Chance For This To Happen*
- *Metro Lawn Supports your Customer, Dealers & Sales*



# REAL Propane Fuel Solutions

*(Fuel Program)*

- Local Suppliers – 450 Locations
- Provide Special Cylinders
- Fuel **YOUR** Way
- Technical Support

*Safety Training*

*Fuel System Support*

*Support on Conversions*

Real Propane Fuel Solutions.  
Go Green. Save Green.

# Propane Alternatives



**Real Propane Fuel Solutions.**

Go Green. Save Green.

# **REAL** Propane Fuel Solutions

Go Green. Save Green.

[www.gogreenmetrolawn.com](http://www.gogreenmetrolawn.com)